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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/804,005	03/19/2004	Leo A. Almeida	NVL 3223	6985

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DEPARTMENT OF THE ARMY  
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EXAMINER

BUI PHO, PASCAL M

ART UNIT

PAPER NUMBER

2878

DATE MAILED: 04/13/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

H.D

<b>Office Action Summary</b>	<b>Application No.</b> 10/804,005	<b>Applicant(s)</b> ALMEIDA, LEO A.	
	<b>Examiner</b> Pascal M. Bui-Pho	<b>Art Unit</b> 2878	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 19 January 2006.
- 2a) ☒ This action is **FINAL**.
- 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-20 is/are pending in the application.  
4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 19 January 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All    b) ☐ Some \*    c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

### **DETAILED ACTION**

This Office action is responsive to communications filed on 19 January 2006. Presently, claims 1-20 are pending.

#### ***Drawings***

1. Replacement drawings were received on 19 January 2006. These drawings are acceptable.

#### ***Claim Objections***

2. Claims 7 and 13 are objected to because of the following informalities:

With regards to claim 7, on line 4, "response of photodetector" should be changed to --response of the photodetector--.

With regards to claim 13, on lines 3 and 4, "wherein each row of the two-dimensional array" should be changed to --wherein each photodetector of the linear array--.

Appropriate correction is required.

#### ***Claim Rejections - 35 USC § 112***

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claim 13 recites the limitation "the two-dimensional array" in line 3. There is insufficient antecedent basis for this limitation in the claim. The rejection may be overcome with the appropriate correction set forth under "Claim Objections".

#### ***Claim Rejections - 35 USC § 102***

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

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A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 1, 3, 17, and 19 are rejected under 35 U.S.C. 102(b) as being anticipated by Kalkhoran et al. (US 5,726,440).

With regards to claim 1, Kalkhoran et al. disclose in Figs. 11, 13, and 14, a multispectral focal plane array comprising: a linear array (194) of photodetectors (196-204), the linear array having opposing sides and a thickness (213) that decreases across the linear array from one side to another and each photodetector in the linear array having a distinct spectral response (Column 11, line 54 – Column 12, line 21); and an integrated circuit (254, 268) coupled to read out of the linear array, wherein the integrated circuit collects electrical signals from the individual photodetectors.

With regards to claim 3, Kalkhoran et al. disclose a multispectral focal plane array wherein the photodetectors are photodiodes (Column 2, lines 58-59).

With regards to claim 17, Kalkhoran et al. disclose a multispectral photodetector array wherein the thickness decreases generally continuously from one side to another.

With regards to claim 19, Kalkhoran et al. disclose a multispectral photodetector array wherein the thickness decreases in a step-wise manner from one side to another (Fig. 11a)

***Claim Rejections - 35 USC § 103***

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 2, 4-16, 18, and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kalkhoran et al. (US 5,726,440) in view of Taylor et al. (US 6,803,557).

With regards to claim 2, Kalkhoran et al. discloses in Figs. 11, 13, and 14, a multispectral focal plane array comprising: an array (194) of photodetectors (196-204), the array having opposing sides and a thickness (213) that decreases across the array from one side to another, and the photodetectors having a distinct spectral response (Column 11, line 54 – Column 12, line 21); and an integrated circuit (254, 268) coupled to a read out of the array, wherein the integrated circuit collects electrical signals from the photodetectors. Kalkhoran et al. however remain silent with regards to a two-dimensional array of photodetectors, wherein the photodetectors are grouped, each group having a distinct spectral response. In an analogous sensing art, Taylor et al. disclose in Fig. 11B a multispectral focal play array comprising a two-dimensional array of photodetectors (10), wherein the photodetectors are grouped, each group having a distinct spectral response ( $\lambda_1, \lambda_2, \lambda_3$ ). At the time of the invention, it would have been obvious to one of ordinary skill in the art to modify Kalkhoran et al. in view of Taylor et al. in order to acquire more reliable sensing results.

With regards to claim 4, Kalkhoran et al. disclose a multispectral focal plane array wherein the photodetectors are photodiodes (Column 2, lines 58-59).

With regards to claims 5 and 6, Kalkhoran et al. disclose a multispectral focal plane array comprising photodetectors (196-204), but lack a clear inclusion of photodetectors fabricated from epilayers of ternary or quaternary compound semiconducting materials whose band-varies via a grading of the chemical composition of the photodetector. In an analogous photodetection art, Taylor et al. disclose in Figs. 1-5 a multispectral focal plane array comprising photodetectors

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(10) fabricated from epilayers of ternary compound semiconducting materials ( $\text{Hg}_{(1-x)}\text{Cd}_x\text{Te}$ , for example) whose bandgap varies via a grading of the chemical composition of the photodetector (Summary; Column 6, line 22 – Column 8, line 44). At the time of the invention, it would have been obvious to one of ordinary skill in the art to modify Kalkhoran et al. in view of Taylor et al. in order to acquire optimal spectral response from the photodetector.

With regards to claims 7, 8, and 11-14 Kalkhoran et al. disclose a multispectral focal plane array comprising photodetectors (196-204) varying in height (213) such that the height determines the distinct spectral response of the photodetector. Kalkhoran et al. however remain silent with a photodetector fabricated from epilayers of compositionally graded compound semiconducting material. In an analogous sensing art, Taylor et al. disclose in Figs 1-5 and 11A-11C, a multispectral focal plane array comprising photodetectors (10) fabricated from epilayers of compositionally graded compound semiconducting material (Summary; Column 6, line 22 – Column 8, line 44). At the time of the invention, it would have been obvious to one of ordinary skill in the art to modify Kalkhoran et al. in view of Taylor et al. in order to acquire more reliable sensing results. The further citations of claims 11-14 would have also been obvious for similar reasons set forth above.

With regards to claims 9 and 10, Kalkhoran et al. disclose a multispectral focal plane array wherein any photodetector (196-204) of a given height (213) detects more long-wavelength photons than those photodetectors which are shorter and fewer long-wavelength photons than those photodetectors which are taller (Column 12, line 39 – Column 13, line 14).

With regards to claims 15 and 16, Kalkhoran et al. disclose a multispectral photodetector array, but lack a clear inclusion of an array comprising a ternary or quaternary compound

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semiconducting material system formed of  $\text{Hg}_{1-x}\text{Cd}_x\text{Te}$ , wherein the band gap of  $\text{Hg}_{1-x}\text{Cd}_x\text{Te}$  varies with chemical composition (x-value). In an analogous sensing art, Taylor et al. disclose an array comprising a ternary compound semiconducting material system formed of  $\text{Hg}_{1-x}\text{Cd}_x\text{Te}$  wherein the band gap of  $\text{Hg}_{1-x}\text{Cd}_x\text{Te}$  varies with chemical composition (Column 6, line 22 – Column 8, line 44). At the time of the invention, it would have been obvious to one of ordinary skill in the art to modify Kalkhoran et al. in view of Taylor et al. in order to gain greater control of the spectral response.

With regards to claim 18, Kalkhoran et al. disclose a multispectral photodetector array wherein the thickness decreases generally continuously from one side to another (Fig. 11a).

With regards to claim 20, Kalkhoran et al. disclose a multispectral photodetector array wherein the thickness decreases in a step-wise manner from one side to another (Fig. 11a).

### ***Response to Arguments***

9. Applicant's arguments with respect to claims 1-16 have been considered but are moot in view of the new ground(s) of rejection.

### ***Conclusion***

10. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period

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will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.


***Telephone/Fax Information***


11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Pascal M. Bui-Pho whose telephone number is (571) 272-2714.

The examiner can normally be reached on Monday through Friday: 8:30 a.m. - 5:00 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Georgia Epps can be reached on (571) 272-2328. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

  
Pascal M. Bui-Pho  
Examiner, Art Unit 2878  
04 April 2006

  
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